III.B.2.N.d.37. SALIX LIGULIFOLIA TEMPORARILY FLOODED SHRUBLAND ALLIANCE

Strapleaf Willow Temporarily Flooded Shrubland Alliance

SALIX LIGULIFOLIA SHRUBLAND

Strapleaf Willow Shrubland

ELEMENT CONCEPT

Summary: This plant association is a medium to tall (5-15 feet, 1.5-3 m) willow shrubland occurring in saturated areas at montane elevations (6700-10,800 feet) of Colorado. It occurs in the wettest part of the riparian area, usually adjacent to the channel on low point bars, islands, and overflow channels. The higher elevation distribution of *Salix ligulifolia* in Colorado occurs in relatively broad valley bottoms along low terraces and floodplains, and along streambanks of narrower reaches. Soils are saturated sandy loams and clay loams with a high organic matter content in the upper layers. *Salix ligulifolia* is found in mixed stands with other willows such as *Salix monticola, Salix geyeriana*, and *Salix drummondiana*. *Salix ligulifolia* is the key diagnostic species, other willows may have equal cover, but in general do not exceed that of *Salix ligulifolia*. The herbaceous undergrowth can be dense in undisturbed stands with *Carex utriculata* (1-40%), *Carex nebrascensis* (1-5%), *Carex lanuginosa* (1-3%), *Juncus balticus* (1-20%), and *Calamagrostis canadensis* (1-27%). Forb cover is generally low. *Salix exigua - Salix ligulifolia* Shrubland (CEGL002655) is a closely related association occurring in the Colorado foothills at lower elevations.

ENVIRONMENTAL DESCRIPTION

USFWS Wetland System: PALUSTRINE

Florissant Fossil Beds NM Environment: The *Salix ligulifolia* Shrubland is unusual within the monument and was growing along a small, low-gradient (approximately 2% slope) drainage that is tributary to Grape Creek. The floodplain associated with this drainage was saturated to the surface and flowing water approximately one meter wide was present. This stand occurred at approximately 8410 feet in elevation.

Global Environment: This association occurs in moderately wide valleys along low terraces and floodplains, and stream banks of narrower reaches. The plant association occurs along reaches with vegetated islands between multiple channels below an active beaver pond (Rosgen's Channel Type: D3), along slightly sinuous broad channels (Rosgen's Channel Type: B2, B4), along more sinuous channels with well-developed floodplains (Rosgen's Channel Type: C4), and along steep narrow gullies (Rosgen's Channel Type: G3) (Rosgen 1996). Soils are saturated sandy loams and clay loams with a high organic matter content in the upper layers.

VEGETATION DESCRIPTION

Florissant Fossil Beds NM Vegetation: Only one stand of this shrubland type was observed and sampled near the northeastern monument boundary. The stand was linear (less than 15 m wide), growing on both banks of a narrow and incised drainage for approximately 20 m. *Salix ligulifolia* was the dominant shrub (approximately 60% foliar cover) at a height of 4–5 m. An additional 5–10% foliar cover within the stand was provided by the shrubs *Salix exigua, Dasiphora fruticosa, Ribes inermis*, and *Rosa woodsii*. Herbaceous cover for this shrubland type was approximately 20%, but no forbs or graminoids individually provided greater than 2–3% herbaceous cover. Graminoids common to this type included the natives *Carex nebrascensis* and *Juncus balticus* and the exotics *Bromus inermis, Poa pratensis*, and *Agrostis stolonifera*. Common forbs included *Heracleum maximum, Maianthemum stellatum, Equisetum arvense, Mertensia ciliata*, and the exotic *Cirsium arvense*. Because a steep cutbank was adjacent to the plot established, some cover was recorded for upland species present. Ground cover at this site was predominantly litter, approximately 90%, with most of the remainder comprised of flowing water.

This small stand is below the minimum mapping unit for the project, but because of its known location could be mapped as a park special. Its aerial photograph signature is identical to other willow associations in the monument, e.g., dark green to nearly black on true color and bright pink to dull red on CIR.

Global Vegetation: This association has a canopy dominated by 15-66% cover of *Salix ligulifolia* usually mixed with several other willow species. *Salix ligulifolia* is the key diagnostic species, other willows may have equal cover, but in general do not exceed that of *Salix ligulifolia*. Other willows that may be present include: *Salix monticola* (3-43% cover), *Salix geyeriana* (1-12% cover), *Salix bebbiana* (3% cover), *Salix lucida* ssp. *lasiandra* (1-20% cover), *Salix exigua* (1-10% cover), *Salix wolfii* (11% cover), and *Salix planifolia* (8% cover). Additional shrubs that may be present include *Alnus incana* (3-10% cover), *Cornus sericea* (21%), and *Dasiphora fruticosa ssp. floribunda* (1-9% cover). The herbaceous undergrowth can be dense in undisturbed stands with *Carex utriculata* (1-40%), *Carex nebrascensis* (1-5%), *Carex lanuginosa* (1-3%), *Juncus balticus* (1-20%), and *Calamagrostis canadensis*

(1-27%). Forb cover is generally low, but some species are abundant: *Taraxacum officinale* (1-10%), *Achillea millefolium* (1%), *Thalictrum fendleri* (1-19%), and *Fragaria virginiana* (1-12%).

Global Dynamics: *Salix ligulifolia* is highly palatable to livestock, therefore, season long grazing, especially late summer and early fall browsing, should be avoided in order to maintain the vigor of woody species (Hansen *et al.* 1995). Overuse by livestock may cause the site to dry and become dominated by introduced grass species such as *Poa pratensis* or *Bromus inermis* (Manning and Padgett 1995). With continued overuse, the willow species will decline and eventually become eliminated from the site (Hansen *et al*. 1995). Beaver can be important in maintaining this plant association. Beaver dams raise the water table, which is beneficial to willow and sedge species as well as other hydrophytic plants. Beaver dams also help control bank erosion, channel downcutting, and the loss of sediment downstream (Hansen *et al*. 1995).

Prescribed fires may be useful for rejuvenating *Salix ligulifolia* since this willow vigorously sprouts after burning, especially in wetter areas (Hansen *et al*. 1995). Willow roots provide stream bank stability and should be considered by managers for stream bank restabilization projects and revegetation purposes (Hansen *et al.* 1995, Padgett *et al.* 1989).

This association appears to be long-lived mid to late-seral type since the stands are associated with beaver activity and saturated soils throughout the growing season.

MOST ABUNDANT SPECIES

Florissant Fossil Beds NM

Stratum	Species
Shrub	*Salix ligulifolia*
Graminoid	*Carex nebrascensis, Juncus balticus, Poa pratensis*
Forb	*Heracleum maximum, Mertensia ciliata, Equisetum arvense*

Global

Stratum	Species
Shrub	*Salix ligulifolia*
Graminoid	*Carex nebrascensis, Juncus balticus, Poa pratensis*
Forb	*Heracleum maximum, Mertensia ciliata, Equisetum arvense*

CHARACTERISTIC SPECIES

Florissant Fossil Beds NM

Stratum	Species
Shrub	*Salix ligulifolia, Salix exigua*
Graminoid	*Carex nebrascensis, Juncus balticus*
Forb	*Equisetum arvense, Heracleum maximum*

Global

Stratum	Species

OTHER NOTEWORTHY SPECIES

Florissant Fossil Beds NM

Global

Stratum	Species

GLOBAL SIMILAR ASSOCIATIONS:

- *Salix exigua* - *Salix ligulifolia* Shrubland (CEGL002655)—found at lower elevations in the Colorado Front Range foothills.

SYNONYMY:

- DRISCOLL FORMATION CODE:III.B.3.c. (Driscoll et al. 1984) B
- *Salix ligulifolia* (Bourgeron and Engelking 1994) =
- *Salix eriocephala* var. *ligulifolia*/mesic graminoid plant association (Kittel *et al.* 1996) =
- *Salix ligulifolia-Salix monticola* plant association (Richard *et al*. 1996) =
- *Salix ligulifolia-Cornus sericea* plant association (Bourgeron and Engelking 1994) =

GLOBAL STATUS AND CLASSIFICATION COMMENTS

Global Conservation Status Rank: G2G3.

Global Classification Comments: The stand at Florissant Fossil Beds National Monument is boarder-line between the foothills *Salix exigua – Salix ligulifolia* Shrubland (CEGL002655) and the montane *Salix ligulifolia* Shrubland (CEGL001218) in Colorado. The overwhelming abundance of *Salix ligulifolia* (60%) to relatively low cover of *Salix exigua* (<10%), and the elevation (8400 feet) place it in the upper elevation, *Salix ligulifolia* Shrubland.

Dorn (1995) has combined *Salix lutea* and *Salix ligulifolia* (as used in Colorado literature) into *Salix eriocephala*. Nearly all Colorado specimens called *Salix lutea* and *Salix ligulifolia* have been placed into *Salix eriocephala var. ligulifolia*. *Salix lutea* specimens found in the extreme northwestern part of Colorado (north of Dinosaur National Monument) have been renamed *Salix eriocephala var. watsonii*, and *Salix lutea* specimens from extreme northeastern Colorado (along the South Platte River near Julesberg) have been renamed *Salix eriocephala var. famelica*. Kartesz (1999) accepts *Salix lutea* and *Salix ligulifolia* as valid species. Colorado specimens of *Salix lutea*, *Salix ligulifolia*, and *Salix eriocephala var. ligulifolia* are called *Salix ligulifolia* by the Kartesz (1999) treatment.

Several closely related *Salix lutea*-dominated community types occur in Montana (Hansen et al. 1995), eastern Wyoming and western Idaho (Youngblood et al. 1985a), and in Nevada (Manning and Padgett 1995). These communities would be dominated by *Salix eriocephala var. watsonii*, if we apply Dorn's (1995) nomenclature.

ELEMENT DISTRIBUTION

Florissant Fossil Beds NM Range: Only one stand of *Salix ligulifolia* Shrubland growing along an unnamed drainage in the northeastern portion of the monument was observed and sampled. This stand was approximately 50 m west of a hiking trail that crosses the drainage on a wooden foot bridge.

Global Range: This association occurs in the mountains of Colorado, where it has a fairly broad range. This association is known from the San Juan National Forest, Rio Grande National Forest, Pike-San Isabel National Forest, and the Arapaho-Roosevelt National Forest.

Nations: US
States/Provinces: CO NM?

ELEMENT SOURCES

Florissant Fossil Beds NM Inventory Notes: Plot 73
Classification Confidence: 2 **Identifier:** CEGL001218
REFERENCES: Baker 1989b, Bourgeron and Engelking 1994, Dorn 1995, Dorn 1997, Driscoll et al. 1984, Hansen et al. 1995, Kartesz 1999, Kittel and Lederer 1993, Kittel et al. 1996, Kittel et al. 1999, Manning and Padgett 1995, Padgett et al. 1989, Richard et al. 1996, Rosgen 1996, Youngblood et al. 1985a